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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/936,618	03/05/2002	Norio Maeda	33093M006	9087

441 7590 07/03/2003

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WASHINGTON, DC 20036

EXAMINER

O MALLEY, KATHRYN S

ART UNIT PAPER NUMBER

3749

DATE MAILED: 07/03/2003

7

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/936,618

Applicant(s)

MAEDA ET AL. *B*

Examiner

Kathryn S. O'Malley

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 March 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 March 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: the specification includes numerous references to claim numbers.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 8, and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Hamano.
4. Hamano teaches a method and apparatus for drying a substrate comprising housing a substrate 9 in a housing 1 filled with pure water used as cleaning fluid, supplying a drying fluid in the form of liquid isopropyl alcohol from a plurality of nozzles 4 to form a liquid layer on the pure water, and lowering the fluid face with respect to the substrate. Note Figures 1a,b, and paragraphs 0018-0024 of the English translation of the Detailed Description of the Invention.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 2, 3, 11, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamano as applied to claims 1 and 10 above, and further in view of Bergman et al.

7. Hamano does not teach a substrate held at an angle with the drying vapor being applied at that same angle or controlling the flow rate of the drying fluid. However, Bergman et al. does so in a similar method and apparatus. Note column 12, lines 53-65 and substrate 15 and nozzles 18 in Figure 1. As Bergman et al. teaches the improved uniformity of drying achieved when controlling the flow rate of a drying fluid, it would have been obvious to one of ordinary skill in the art to modify the drying process and apparatus of Hamano with the controlled flow rate and direction of Bergman et al.

8. Claims 4, 5, 7, 13, 14, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamano as applied to claims 1 and 11 above, and further in view of Kamikawa.

9. Hamano does not teach supplying the drying chamber with inert gas and increasing the level supplied when the substrate is raised from the cleaning and drying fluid. However, in a similar method and apparatus, Kamikawa teaches nozzles 85 and 86 to supply inert gas to a substrate drying chamber while the substrate is submerged in

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a cleaning fluid, and nozzles 106 and 107 to increase the amount of inert gas supplied when the fluid face of the cleaning fluid is moved past the substrate. Note column 13, lines 44-62; and Figure 4. As Kamikawa teaches the increased efficiency in drying achieved with including an inert gas in a substrate drying method and apparatus, it would have been obvious to one of ordinary skill in the art to modify the dryer of Hamano with the inert gas of Kamikawa.

10. Claims 6, 15, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamano as applied to claims 1 and 10 above, and further in view of Fung et al.

11. Hamano does not teach a pair of supporting members with grooves for supporting the wafers at different positions. However, Fung et al. does so in a similar method and apparatus. Note holders 12 and 24 in column 2, lines 46-67 and Figure 1b. As Fung et al. teaches that supporting the substrates in multiple positions and with grooves leads to less water spots left on the substrates after drying, it would have been obvious to one of ordinary skill in the art to modify the supporting position of Hamano with the multiple supporting positions of Fung et al.

12. Claims 9 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamano as applied to claims 1 and 10 above, and further in view of Vellutato.

13. Hamano does not teach providing the drying fluid through the nozzle with pressure from an inert gas. However, Vellutato does so in a similar method and apparatus. Note column 4, lines 12-15. As Vellutato teaches that pressure from an inert gas is commonly known in the art to efficiently direct isopropyl alcohol for drying

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substrates, it would have been obvious to one of ordinary skill in the art to modify the dryer of Hamano with the inert gas pressure of Vellutato.

14. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hamano as applied to claim 10 above, and further in view of Takase et al.

15. Hamano does not teach moving the nozzle closer to the substrate after it has been removed from the cleaning solution. However, Takase et al. does so in a similar dryer. Note column 10, lines 42-63 and Figures 9 and 10. As moving the nozzles across and toward the substrate with result in more precise directing of the drying fluid, it would have been obvious to one of ordinary skill in the art to modify the dryer of Hamano with the moving nozzles of Takase et al.

16. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hamano as applied to claim 1 above, and further in view of Taniyama et al.

17. Hamano does not teach circulation means for the liquid components used in his drying method and apparatus. However, Taniyama et al. does so in a similar method and apparatus. Note column 7, lines 27-49 and Figure 4. As Taniyama et al. teaches that circulation means will keep liquids for substrate treatment purified, leading to less contaminants on the finished substrate, it would have been obvious to one of ordinary skill in the art to modify the liquid drying fluid supply of Hamano with the circulation means of Taniyama et al.

18. Claims 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamano.

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19. While Hamano teach a plurality of nozzles 4, he does not define the exact number. However, it would have been obvious to one having ordinary skill in the art to use the number presently claimed since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Conclusion

20. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Koyanagi et al. and Onoda et al teach similar substrate treatment methods and apparatus.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kathryn S. O'Malley whose telephone number is (703)308-2844. The examiner can normally be reached on M-F (8:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ira Lazarus can be reached on (703)308-1935. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-9302 for regular communications and (703)872-9303 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-1148.

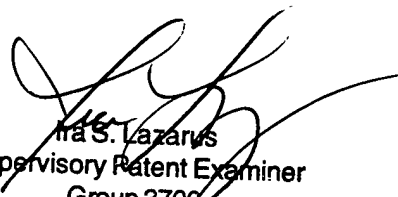
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KSO

June 30, 2003



Ira S. Lazarus
Supervisory Patent Examiner
Group 3700